

## ABSTRACT OF THE DISCLOSURE

A motion vector calculating method is disclosed which includes the steps of: (a) extracting a reference block from a reference picture

5 corresponding to a current block of a current picture to be processed, the size and origin of the reference block matching those of the current block; (b) while moving the reference block in a predetermined search area,

obtaining a residual between the current block; (c) detecting a block with the minimum residual from the reference picture so as to calculate a

10 motion vector; (d) orthogonally transforming pixel data of a reference block and pixel data of a current block of the current picture and (e)

obtaining a residual between orthogonally transformed data of the reference block and orthogonally transformed data of each block of the current picture. In some embodiments, the motion vector calculation

15 stops when a residual is larger than a predetermined value, which may be based on a characteristic of a picture. A motion vector for an entire

picture may be calculated based on a motion vector detected in a plurality of macro blocks, or vice versa. The orthogonal transformation may be

skipped if the residual is smaller than a predetermined value. Various

20 methods of increasing the speed of calculation by using fewer than all pixels in a macro block are provided, such as using only those pixels on the circumference of a macro block. Media with computer programs

according to the foregoing methods and apparatuses for performing the foregoing methods are provided.

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